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Item 4.8.2 of the provisional agenda

**1958 Agreement – Consideration of draft amendments
to existing Regulations submitted by GRPE**

Proposal for Supplement 1 to the 01 series of amendments to UN Regulation No. 101 (CO₂ emission/fuel consumption)

Submitted by the Working Party on Pollution and Energy*

The text reproduced below was adopted by the Working Party on Pollution and Energy (GRPE) at its sixty-third session to introduce amendments to UN Regulation No. 101. It is based on ECE/TRANS/WP.29/GRPE/2012/2, as amended by paragraph 21 of the report (ECE/TRANS/WP.29/GRPE/63). It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1) for consideration.

* In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208, para. 106 and ECE/TRANS/2010/8, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

Paragraph 5.3.2., amend to read:

"5.3.2. The technical service in charge of the tests conducts the measurement of the electric range of the vehicle according to the method described in Annex 9."

Paragraph 5.4.6., amend to read:

"5.4.6. The technical service in charge of the tests conducts the measurement of the electric range of the vehicle according to the method described in Annex 9 to this Regulation. The result shall be expressed in km, rounded to the nearest whole number."

Insert new paragraphs 5.5.4. to 5.5.7., to read:

"5.5.4. The electric range value adopted as the type approval value shall be the value declared by the manufacturer if this is no more than the value measured by the technical service. The declared value may be lower than the measured value without any limitations.

5.5.5. If the declared range value exceeds the value measured by the technical service, then another test is run on the same vehicle. When the manufacturer's declared value does not exceed the average of the two test results, then the value declared by the manufacturer is taken as the type approval value.

5.5.6. If the declared value still exceeds the average measured value a final test is run on the same vehicle. The average of the three results is taken as the type approval value.

5.5.7. The electric range determined according to paragraphs 5.5.4 to 5.5.6 is the only one which may be included in sales promotional material. This value must also be used for the calculations in Annex 8 paragraphs 3.4.2.1 and 3.4.4.1."

Annex 9, Paragraphs 4.1.1.3.1., amend to read:

"4.1.1.3.1. If there is not a pure electric position, the manufacturer shall provide the means for performing the discharge of the battery with the vehicle running in pure electric operating state."

Annex 9, paragraphs 4.2.2.1. to 4.2.2.1.5., amend to read:

"4.2.2.1. To determine the electric range of a hybrid electric vehicle

4.2.2.1.1. The applicable test sequence and accompanying gear shift prescription, as defined in paragraph 1.4. of Annex 8, is applied on a chassis dynamometer adjusted as described in Appendices 2, 3, and 4 of Annex 4 of Regulation No. 83, until the end of the test criteria is reached.

To determine the electric range (De) of OVC HEVs equipped with an operating mode switch the same operating mode position, in accordance with

Table 4.1.3 and section 4.2.1 of Annex 8, shall be used as for the determination of CO₂ and fuel consumption.

- 4.2.2.1.2. To measure the electric range the end of the test criteria is reached when the vehicle is not able to meet the target curve up to 50 km/h, or when an indication from the standard on-board instrumentation is given to the driver to stop the vehicle or when the battery has reached its minimum state of charge. Then the vehicle shall be slowed down to 5 km/h by releasing the accelerator pedal, without touching the brake pedal and then stopped by braking.
- 4.2.2.1.3. At a speed over 50 km/h, when the vehicle does not reach the required acceleration or speed of the test cycle, the accelerator pedal shall remain fully depressed until the reference curve has been reached again. The maximum possible speed in pure electric operating state in the first combined cycle shall be recorded in the test report and in the drivers' handbook of production vehicles.

During this procedure, the electricity balance (QES_i) of the high voltage battery (expressed in Ampere hours), measured continuously and using the procedure specified in Appendix 2 to the Annex 8 of this Regulation, the vehicle speed (VES_i) and De_i shall be recorded at the instant when the fuel consuming engine starts and the accumulation of De_i shall be stopped. Further accumulation of De_i shall not be permitted unless

- (a) The fuel consuming engine stopped running; and
- (b) VES_i has returned to the same or any lower level of VES_i as recorded before the fuel consuming engine started; and
- (c) QES_i has returned to the same or any lower level of QES_i as recorded before the last fuel consuming engine start or, where applicable, to the same or any lower level of QSA_i as determined in accordance with paragraph 4.2.2.1.3.1.

This procedure shall be followed until the end of the test as defined in paragraph 4.2.2.1.2.

- 4.2.2.1.3.1. During the first deceleration phase following each start of the fuel consuming engine, when the vehicle speed is less than the vehicle speed at which the fuel consuming engine started previously
- (a) The distance covered with engine off should be counted as De_i; and
 - (b) The increase in electricity balance during this period should be recorded (ΔQrb_i); and
 - (c) The electricity balance when the fuel consuming engine starts (QES_i) defined previously should be corrected by ΔQrb_i (hence new QSA_i= QES_i + ΔQrb_i);

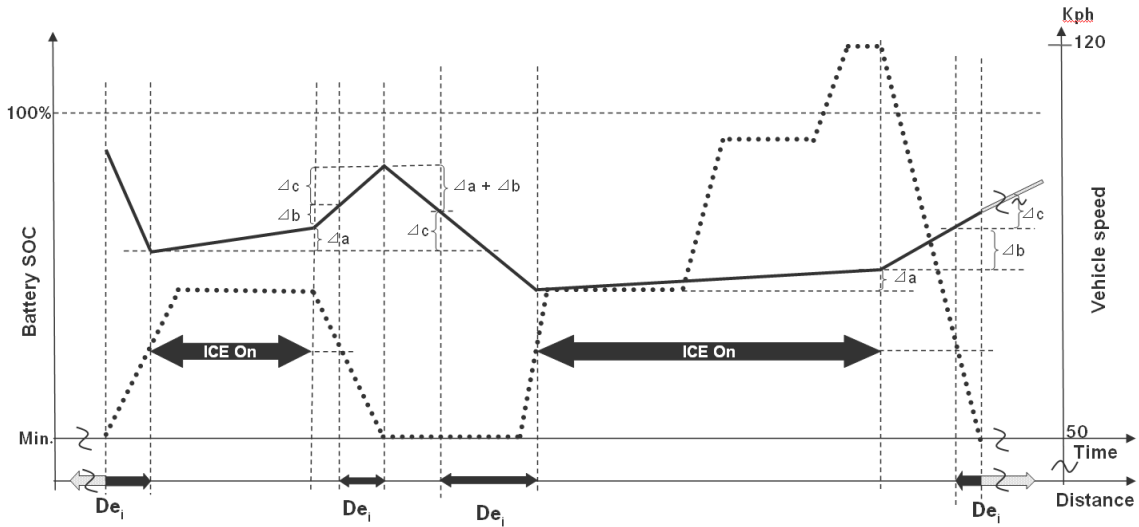
VES_i: Vehicle speed at the moment when the ICE starts;

QES_i: Energy of the battery at the moment when the ICE starts;

ΔQrb_i: The increase in electricity balance during deceleration phases, when the vehicle speed is less than the vehicle speed at which the ICE started previously;

QSA_i: Energy of the battery at the moment of the further accumulation of De.

Example:



Δa: Charged by ICE

Δb: Charged by regeneration (vehicle acceleration by ICE)

Δc: Charged by regeneration (ΔQ_{rb_i} , vehicle acceleration with energy from battery)

$De = \sum De_i$

De_i = Distances where the propulsive energy was not produced by ICE

————— Battery SOC

..... Vehicle Speed

4.2.2.1.4. To respect human needs, up to three interruptions are permitted between test sequences, of no more than 15 minutes in total.

4.2.2.1.5. At the end, the electric range is the sum of all cycle portions De_i in km. It shall be rounded to the nearest whole number."